

REMARKS

Claims 1-14 and 16-22 will be pending upon entry of these amendments. Claim 15 is canceled without prejudice or disclaimer. Claim 14 has been amended for clarity and to incorporate a limitation from claim 15. New claims 18-20 cover embodiments in which the composite includes Al and Y as the two metallic elements E and F recited in claim 14. Support for these new claims is found in the specification, for example, at page 8, lines 23-32. New claim 21 specifies that the multielement nanopowder is produced using laser pyrolysis, and is supported at page 2, lines 8-20. New claim 22 specifies that each grain of the multielement nanopowder contains the elements Si, C, N, E<sub>a</sub>, F<sub>b</sub>, G<sub>c</sub>, and O; this is supported at page 7, lines 28-29. No new matter has been added.

The claims are rejected for alleged indefiniteness and lack of novelty. The rejections are respectfully traversed, and their reconsideration and withdrawal are respectfully requested.

Rejection Under 35 U.S.C. 112, Second Paragraph

Claims 14 and 15 are rejected as allegedly indefinite because the term "the grains" lacks antecedent basis, in that it is

unclear whether the term refers to the composite ceramic or the starting powder. Claim 14 has been amended to recite "the grains of the composite ceramic" and specifically states the source of the grains. Therefore, the rejection has been overcome.

Rejection Under 35 U.S.C. 102(b) or 103(a)

Claims 14 and 15 are rejected as allegedly anticipated, or in the alternative rendered obvious, by Yoshimura WO20085812, equivalent to U.S. 6,844,282. Yoshimura is cited as teaching a sintered composite containing silicon nitride, carbon, and sintering aids  $\text{Y}_2\text{O}_3$  and  $\text{Al}_2\text{O}_3$ , as well as a particle size of 100 nm or less. The Office Action concedes that Yoshimura does not teach using a multielement powder; however, this distinction is given no patentable weight, because it is alleged to have no effect on the final composite.

The composite ceramic as presently recited in claim 14 includes the following properties: (i) the composite ceramic is of the  $\text{Si}_3\text{N}_4/\text{SiC}$  type; (ii) the ceramic comprises at least the elements Si, C, N, and from one to three distinct metallic elements other than Si; (iii) the grains of the composite ceramic are of a size smaller than 100 nm; and (iv) the ceramic has a

density that is equal to at least 99.5% of its theoretical density.

Yoshimura fails to teach or suggest at least property (iv), a high density that is at least 99.5% of the theoretical density. Yoshimura's composite is of the type disclosed in the present specification at page 1, lines 33-36 and on page 2, lines 1-7. This type of composite results from simply mixing nanopowders followed by sintering, and it yields inferior results, as described at page 2, lines 2-7:

The step of mixing the nanopowder with sintering additives is nevertheless always difficult, and the distribution of the additive is never uniform. Unfortunately, this poor distribution can lead to defects in the final ceramic, thereby degrading its properties.

The present invention overcomes these deficiencies, particularly the uneven distribution of additives such as  $\text{Y}_2\text{O}_3$  and  $\text{Al}_2\text{O}_3$ , by using a multielement powder instead. This allows the composite to achieve a very high density, which is at least 99.5% of the theoretical density. As this feature is neither disclosed nor suggested in the cited Yoshimura reference, the present claims are neither anticipated nor obvious.

The withdrawal of the rejection is respectfully requested.

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The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

ROMUALD DEZ ET AL.

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By: /Charles L. Gagnebin iii/  
Charles L. Gagnebin III  
Registration No. 25,467  
Attorney for Applicant(s)

WEINGARTEN, SCHURGIN,  
GAGNEBIN & LEBOVICI LLP  
Ten Post Office Square  
Boston, MA 02109  
Telephone: (617) 542-2290  
Telecopier: (617) 451-0313

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